WHAT IS CLAIMED IS:

1. A silicon annealed wafer, on the surface of which a COP defect free layer having a thickness of 5 μm or more is formed by annealing a base material wafer, wherein said base material wafer includes:

a COP defect region of a single crystal containing nitrogen at a concentration of less than 1×10^{14} atoms/cm^3, wherein said COP defect has a size of 0.1 μm or less in the highest frequency of occurrence and there exist no COP defects having a size of more than 0.2 μm;

oxygen precipitates formed at a density of 1×10^4 counts /cm^2 or more when said base material wafer is subjected to a oxygen precipitate evaluation heat treatment; wherein

the ratio of the maximum to the minimum of BMD (oxygen precipitate) density is 3 or less in the radial direction of said base material wafer.

2. A silicon annealed wafer according to Claim 1, wherein the oxygen concentration of said base material wafer is $11 \times 10^{17} - 17 \times 10^{17}$ atoms/cm^3 (ASTM F-121, 1979).

3. A silicon annealed wafer according to Claim 1, wherein said COP defect occurrence region extends over an 80% or more surface area of said base material wafer in the radial direction.

4. A silicon annealed wafer according to one of Claims 1 to 3, wherein the annealing process is performed at 1100°C – 1250°C for 1 – 4 hours in a hydrogen gas, argon gas, helium gas or a mixed gas thereof.

5. A silicon annealed wafer, on the surface of which a COP defect free layer

having a thickness of 5 μm or more is formed by annealing a base material wafer, wherein

said base material wafer contains nitrogen at a concentration of less than 1×10^{14} atoms/cm^3, and

said base material wafer is grown by the Czochralski method under the following conditions:

the temperature gradient ratio Gc/Ge is 1.0 – 1.5 where Gc (°C/mm) and Ge (°C/mm) are averaged temperature gradients in the axial direction of pulling at a temperature range from 1370°C to 1310°C for the center and the outer periphery of said base material wafer, respectively;

the cooling time from 1200°C to 1000°C is within 50 min; and

the cooling time from 1030°C to 920°C is within 30 min.

6. A silicon annealed wafer according to Claim 5, wherein the oxygen concentration of said base material wafer is $11 \times 10^{17} - 17 \times 10^{17}$ atoms/cm^3 (ASTM F-121, 1979).

7. A silicon annealed wafer according to Claim 5 or 6, wherein the annealing process is performed at 1100°C – 1250°C for 1 – 4 hours in a hydrogen gas, argon gas, helium gas or a mixed gas thereof.

8. A silicon epitaxial wafer produced by forming an epitaxial layer on the surface of a base material wafer,

wherein said base material wafer includes:

a COP defect occurrence region of a single crystal containing nitrogen at a concentration of less than 1×10^{14} atoms/cm^3, wherein said COP defect has a size of 0.1 μm or less in the highest frequency of occurrence and there exist no COP defects having a size of more than 0.2 μm;

oxygen precipitates formed at a density of 1×10^4 counts /cm^2 by

applying a oxygen precipitate evaluation heat treatment; wherein

the ratio of the maximum to the minimum of BMD (oxygen precipitate) density is 3 or less in the radial direction of said base material wafer.

9. A silicon epitaxial wafer according to Claim 8, wherein the oxygen concentration of said base material wafer is $11 \times 10^{17} - 17 \times 10^{17}$ atoms/cm^3 (ASTM F-121, 1979).

10. A silicon epitaxial wafer according to Claim 8, wherein said COP defect occurrence region extends over an 80% or more surface area of said base material wafer in the radial direction.

11. A silicon epitaxial wafer produced by forming an epitaxial layer on the surface of a base material wafer,

wherein said base material wafer contains nitrogen at a concentration of less than 1×10^{14} atoms/cm^3, and

said base material wafer is grown by the Czochralski method under the following conditions:

the temperature gradient ratio Gc/Ge is 1.0 – 1.5 where Gc (°C/mm) and Ge (°C/mm) are averaged temperature gradients in the axial direction of pulling at a temperature range from 1370°C to 1310°C for the center and the outer periphery of said base material wafer, respectively;

the cooling time from 1200°C to 1000°C is within 50 min; and

the cooling time from 1030°C to 920°C is within 30 min.

12. A silicon epitaxial wafer according to Claim 11, wherein the oxygen concentration of said base material wafer is 11×10^{17} - 17×10^{17} atoms/cm^3 (ASTM F-121, 1979).